

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS**

**THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE AWARD OF DEGREE  
OF BACHELOR OF SCIENCE IN APPLIED COMPUTER SCIENCE**

**ACSC 351: INTRODUCTION TO DATABASES**

**STREAMS: BSC (APPLIED COMPUTER SCIENCE) Y3S1      TIME: 2 HOURS**

**DAY/DATE: TUESDAY 11/12/2018      11.30 A.M. – 1.30 P.M.**

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**INSTRUCTIONS:**

- Answer Question **ONE** and any other **TWO** questions.
- Diagrams should be used whenever they are relevant to support an answer.
- This is a closed book exam, no reference materials are allowed in the examination room
- All mobile phones in an examination room must be switched off.

**SECTION A: COMPULSORY**

**QUESTION 1: [30 MARKS] COMPULSORY**

- a. Using an example, explain the following categories of data types  
i) simple data type (2 marks)  
ii) complex data type (2 marks)  
iii) specialized data type (2 marks)
- b. With the help of a diagram explain RAID-5 data storage system (5 marks)
- c. Outline FOUR advantages of networked database models. (4 marks)

- d. You have been called upon to develop strategies for database security, identify FIVE factors that you would put in place when developing the security strategies  
(5 marks)
- e. Explain FIVE types of queries used in SQL databases  
(5 marks)
- f. During the development and usage of databases, there are a number of persons who are involved in the database environment. Highlight the usage of FIVE persons found in the database environment.  
(5 marks)

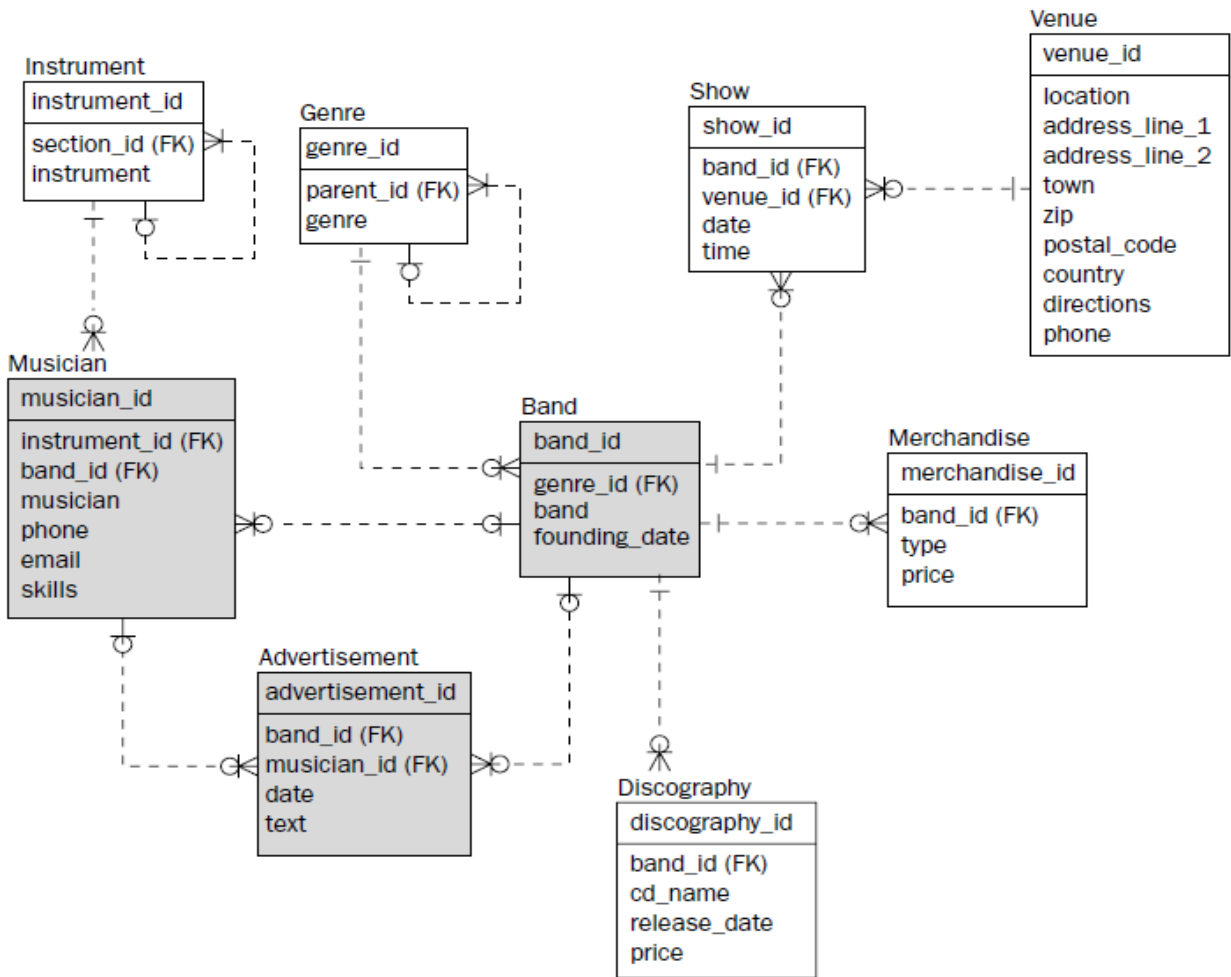
**SECTION B: ANSWER ANY TWO QUESTIONS FROM THIS SECTION**

**QUESTION 2: [20 MARKS]**

- a) Using sketches in each case, explain the following map operations on databases.
- i) Equijoin (2marks)
  - ii) Product (2marks)
  - iii) Intersection (2marks)
- b) Explain THREE conditions for a table to have been normalized to 2<sup>nd</sup> Normal form posess.  
(6 marks)
- c) With reference to database redundant relationships
- i) Explain what are redundant relationships  
(2marks)
  - ii) Outline TWO conditions for a redundant relationship (4 marks)
  - iii) Using a simple ER diagram explain how one solves the problems of a redundant relationship  
(2marks)

**QUESTION 3: [20 MARKS]**

A student developed a database model below, which was to be used to develop a certain musical band database.



- i) Are the tables in the model normalized? If not explain an instance that needs normalization (2 marks)
- ii) Write SQL code for developing the database (18 marks)

**QUESTION 4: [20 MARKS]**

- a) With reference to normalization, answer the following questions.
  - i) Using a drawing of a single un-normalized table, with about 4 fields and 6 tuples, illustrate the concept of multiple valued dependencies, and Update anomaly. (6 marks)
  - ii) Correct the table above to remove the anomalies. (3marks)
  - iii) Write an SQL code to come up with the above table without anomalies. (4marks)

- b) Using a single diagram in a school environment; illustrate the instance of generalization, specialization, and inheritance  
(7 marks)

**QUESTION 5: [20 MARKS]**

- a) Explain FIVE file operations that could be done on database files  
(5 marks)
- b) Explain FIVE types of attributes that can be found in a database  
(5 marks)
- c) Outline FIVE logical operators found in SQL  
(5 marks)
- d) Write the steps of designing a query using design view in Microsoft access  
(5 marks)

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